

Long-term control of smooth scouringrush control with RT 3[®] and Finesse[®] in wheat/fallow cropping systems

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Smooth scouringrush (*Equisetum laevigatum*) control in wheat/fallow rotations in eastern Washington has been difficult because of limited effective herbicide options. In different studies, we have shown that applications of Finesse (chlorsulfuron + metsulfuron) can have activity on smooth scouringrush at least a year after application; however, tank mixing RT 3 (glyphosate) with Finesse in fallow-year applications may increase control of smooth scouringrush into the following crop year and beyond. RT 3 has been effective when applied at a high rate and with an organosilicone surfactant. In contrast, Finesse is effective for at least two years after application, but when applied alone, does not control some other weeds that might be present in the fallow. This study examines the effect of Finesse and RT 3 applied alone or in combination at different rates of RT 3 one year after application in fallow.

Study trials were initiated in 2020 on the Lambert farm near Dayton, WA, and the Hall farm near Steptoe, WA. The Dayton site is on a 30-40% northwest facing slope with a Walla Walla silt loam well-drained soil with pH 5.4 and 2.1% soil organic matter in the top 6 inches. The Steptoe site is on low-lying flat with a Covello silt loam that is sometimes inundated with water during winter or early spring. Soil pH measured 5.8 and organic matter measured 2.9% in the top 6 inches. Treatments were applied July 6, 2020, in no-till fallow at the Dayton and Steptoe sites. All plots measured 10 by 30 ft and were arranged in a randomized complete block design with four replications per treatment. All treatments were applied with a hand-held spray boom with six TeeJet[®] XR11002 nozzles on 20-inch spacing and pressurized with a CO₂ backpack at 3 mph. Spray output was 15 gpa at 25 psi. All treatments included an organosilicone surfactant (Silwet[®] L77). Initial smooth scouringrush density in 2020 averaged 326 and 279 stems/yard² at the Dayton and Steptoe sites, respectively. In October 2020 the Dayton and Reardan sites were seeded to winter wheat.



Figure 1. Wheat row on left with smooth scouringrush not treated in 2020 compared with Finesse treated row on the right.

In July 2021, winter wheat at Dayton and Steptoe was ripening when smooth scouringrush stems were counted in two 1-meter quadrats per plot, one year after treatment. At Dayton, the

nontreated check plots averaged 122 stems/yd² in the 2021 winter wheat, 37% of the initial density, which illustrates that winter wheat is somewhat competitive with smooth scouringrush. This difference was even more dramatic at Steptoe (Table 1). At both locations, the weakest treatment was 32 oz/A of RT 3, which was 55% of the nontreated check at Dayton, and 3% at Steptoe. All treatments with Finesse resulted in zero stems in the winter wheat (Figure 1). At Dayton, the 64 and 96 oz/A rates of RT 3 with no Finesse resulted in 30 and 23 stems/yd² but at Steptoe, all treatments except the 32 oz/A RT 3 had zero stems/yd². The treatments applied in 2020 at Dayton were much slower to show symptoms compared with the Steptoe and this difference was likely related to soil temperature and moisture differences at the time of application. The Steptoe site had warmer soil temperature at application and was located on low-lying flat with the potential for adequate soil water. In contrast, the Dayton site was on the upper part a steep north-facing slope and had cooler temperatures at application. It is difficult to determine if RT 3 aided Finesse since all applications with Finesse resulted in zero stems, however, stem counts will be taken again in 2022 to see if other treatment differences begin to show over time.

Table 1. Smooth scouringrush density in winter wheat one year after applications of RT 3 and Finesse in fallow at Dayton and Steptoe, WA.

Treatments	Rates*	Smooth scouringrush stem density – July 2021**	
		Dayton	Steptoe
	oz/A	stems/yd ²	
Nontreated check	none	122 a	29 a
RT 3	32	67 b	1 b
Finesse	0.5	0 d	0 c
RT 3 + Finesse	32 + 0.5	0 d	0 c
RT 3	64	30 c	0 c
RT 3 + Finesse	64 + 0.5	0 d	0 c
RT 3	96	23 c	0 c
RT 3 + Finesse	96 + 0.5	0 d	0 c
Initial stem density - 2020		326	279

*All herbicide treatments included Silwet L77 organosilicone surfactant at 0.5% v/v. Rates of RT 3 are in fluid oz/A; Finesse rate is in dry oz/A.

**Means are based on four replicates per treatment. Means within a column for each location followed by the same letter are not significantly different at the 95% probability level, which means that we are not confident that the difference is the result of treatment rather than experimental error or random variation associated with the experiment.